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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/363,191	07/29/1999	NAOYUKI KOFUJI	H-811	7803
24956	7590	12/06/2004	EXAMINER	
MATTINGLY, STANGER & MALUR, P.C. 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314			ALEJANDRO MULERO, LUZ L	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 12/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/363,191	<b>Applicant(s)</b> KOFUJI ET AL.	
	<b>Examiner</b> Luz L. Alejandro	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 6, 8, 9 and 34-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6, 8, 9 and 34-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2, 4, 6, 8-9, 34-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed fails to provide support for instant claimed invention of a dry etching apparatus wherein the antenna includes a discoidal electrode to which Ultra High Frequency is applied, an earth electrode and a dielectric plate provided between the discoidal electrode and the earth electrode.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 39-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Once a limitation is introduced in a claim sequence subsequent use of that limitation must use either --the-- or --said--, or be appropriately differentiated to represent a different limitation, note that the terms "A dry etching apparatus" in line 1 of claims 39 and 40. Furthermore, note that claims 1 and 34 do not recite the phrase "for treating a semiconductor wafer, therefore, its use in the preamble of claims 39 and 40 is improper.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 4, 6, 8 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., EP 0,779,644 A2.

Yokogawa et al. shows the invention as claimed including an apparatus for treating a body comprising: a chamber 101; a sample holder 111 in said chamber designated to hold a wafer with a predetermined diameter; means 120 for introducing gas into said chamber; means for exhausting said gas in said chamber; a power supply 104 of ultra high frequency (500 MHz); a coil 102 located outside the chamber; an electromagnetic wave radiation antenna 107 coupled to said power supply and installed in an atmosphere; wherein said antenna 107 is a plate antenna (see figs. 1-2 and col. 5-line 3 to col. 7-line 3). Additionally, note that the antenna of the apparatus of Yokogawa et al. includes a discoidal electrode 107 to which the Ultra High Frequency is applied, an earth electrode 105, and a dielectric plate 106 which is provided between the discoidal electrode and the earth electrode.

Yokogawa et al. is applied as above but fails to expressly disclose that the antenna is located in an atmosphere different than the low vacuum in which the exhausting means is located and that a separation means is located between both locations. However, Yokogawa et al. discloses an apparatus in which the antenna is located in such a claimed atmosphere, that can be readily manufactured and maintained (see fig. 12 and col. 16-line 15 to col. 17-line 10). Therefore, in view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the embodiment disclosed in fig. 1, as to

locate the antenna as shown in the embodiment of fig. 12 of Yokogawa et al., because in such a way the apparatus can be readily manufactured and maintained.

Regarding the diameter of the discoidal electrode being not less than that of the wafer, such limitation is directed to a method limitation instead of an apparatus limitation and since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore, do not patentably distinguish the claimed invention. The apparatus of Yokogawa et al. is capable of processing a wafer having a diameter less than the diameter of the discoidal electrode.

With respect to claim 4, official notice was taken with respect to the well known use of showerheads for uniform distribution of gases in the office action mailed 5/22/01, and therefore this limitation is taken to be admitted prior art.

With respect to the claimed distance between the showerhead and the substrate holder, such limitation is considered to involve routine optimization which has been held to be within the level of ordinary skill in the art. Therefore, one of ordinary skill in the art at the time the invention was made would have modified Yokogawa et al. by having a distance between the gas introduction means and the substrate holder of 100 mm in order to optimize the apparatus and the process being performed in the apparatus.

Furthermore, Yokogawa et al. states that the size of the circular conductive plate is set to a diameter in which a specific resonance mode of the electromagnetic wave can be obtained (col. 5, lines 33-36). Therefore, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to modify the size of the conductive plate as to obtain the desired claimed resonance mode of electromagnetic waves, as to optimize the apparatus and/or the process performed in the apparatus.

Claims 9 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., EP 0,779,644 A2 in view of Nakano et al., U.S. Patent 6,155,202.

Yokogawa et al. is applied as above but does not expressly disclose that the power supply is provided in the form of a cone, but it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Yokogawa et al. as to provide the power supply in the form of a cone because, as disclosed by Nakano et al., better power consumption efficiency and optimization of the film being formed results (see col. 11-lines 40-45 and fig. 16 and its description).

Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., EP 0,779,644 A2 in view of Li et al., US 6,009,830 or Fairbairn et al., US 5,614,055.

Yokogawa et al. is applied as above but does not expressly disclose the use of a gas shower plate which its diameter is less than or equal to  $\frac{3}{4}$  of the diameter of the wafer. Li et al. discloses an apparatus in which a gas shower plate is used as the gas introducing means. Furthermore, the reference clearly discloses that the showerhead is smaller in diameter than the wafer being processed (see, for example, figs., 1-2, and their descriptions, and col. 3, lines 43-50). Additionally, Fairbairn et al. discloses an

apparatus in which a gas shower plate is used as the gas introducing means, wherein the shower plate is smaller in diameter than the wafer being processed (see, for example, fig. 4 and its description). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Yokogawa et al. as to comprise a shower plate, as taught by Li et al. or Fairbairn et al., because in such a way the gas is uniformly distributed into the apparatus and it is more efficiently and effectively directed and concentrated towards the wafer being processed. Furthermore, the limitation of the gas shower plate having a diameter less than or equal to  $\frac{3}{4}$  of the diameter of the wafer, is directed to a method limitation instead of an apparatus limitation and since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of Yokogawa et al. modified by Li et al. or Fairbairn et al. is capable of processing a wafer having a diameter bigger than the shower plate, as claimed.

### ***Response to Arguments***

Applicant's arguments filed 9/27/04 have been fully considered but they are not persuasive.

Applicant argues that the specification, as originally filed, provides support for the limitation of a dry etching apparatus wherein the antenna includes a discoidal electrode



to which Ultra High Frequency is applied, an earth electrode and a dielectric plate provided between the discoidal electrode and the earth electrode. Applicant cites page 6, lines 27-30 of the instant application, as well as page 1 with reference to fig. 2 of the instant application, as support for such limitation. However, the examiner kindly disagrees since the specification, as originally filed, does not provide support in page 6, lines 27-30 for the instant limitation. Furthermore, it should be noted that: a) page 1 of the instant application describes the apparatus of the prior art (fig. 2); b) the discoidal electrode 1 shown in figure 2 (prior art) does not necessarily have to be the same as reference number 1, as shown in figure 1 (the instant invention); c) one of ordinary skill in the art would not realize that the discoidal electrode of fig. 2 (prior art) is the same as the discoidal electrode of fig. 1 (the instant invention); and d) there is no disclosure in the specification, as originally filed, that the discoidal electrodes of figures 1 and 2 are the same. Additionally, applicant contends that US Patent 5,891,252 provides support under 35 USC 112, first paragraph, for the claimed electrode structure, since such reference was incorporated by reference in the specification of the instant application. However, it should be noted that the apparatus claimed in the '252 Patent is not the same apparatus as the apparatus disclosed and claimed in the instant claimed invention, and furthermore, "To incorporate material by reference, the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents." *Id.* at 1282, 54 USPQ2d at 1679, citing *In re Seversky*, 474 F.2d 671, 674, 177 USPQ 144, 146 (CCPA 1973), and *In re Sanders*, 444 F.2d 599, 602-603, 170 USPQ 213, 216-17 (CCPA 1971).

Since the specification, as originally filed, fails to identify with detailed particularity that the electrode structure is being incorporated by reference from the US Patent 5,891,252 reference, the instant application fails to provide support under 35 USC 112, first paragraph, for the claims in the rejection detailed above. Therefore, the rejection under 35 U.S.C. 112, first paragraph is respectfully maintained.

Regarding applicant's argument with respect to the limitation requiring the diameter of the discoidal electrode being not less than that of the wafer, the examiner kindly points out that such limitation is directed to a method limitation instead of an apparatus limitation and since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses that do not further limit, and therefore, do not patentably distinguish the claimed invention. The apparatus of Yokogawa et al. is capable of processing a wafer having a diameter less than the diameter of the discoidal electrode. Furthermore, note that the newly added limitations to the independent claims do not add any structure limitation to the instant claimed invention.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Luz L. Alejandro', written in a cursive style.

Luz L. Alejandro  
Primary Examiner  
Art Unit 1763

December 2, 2004